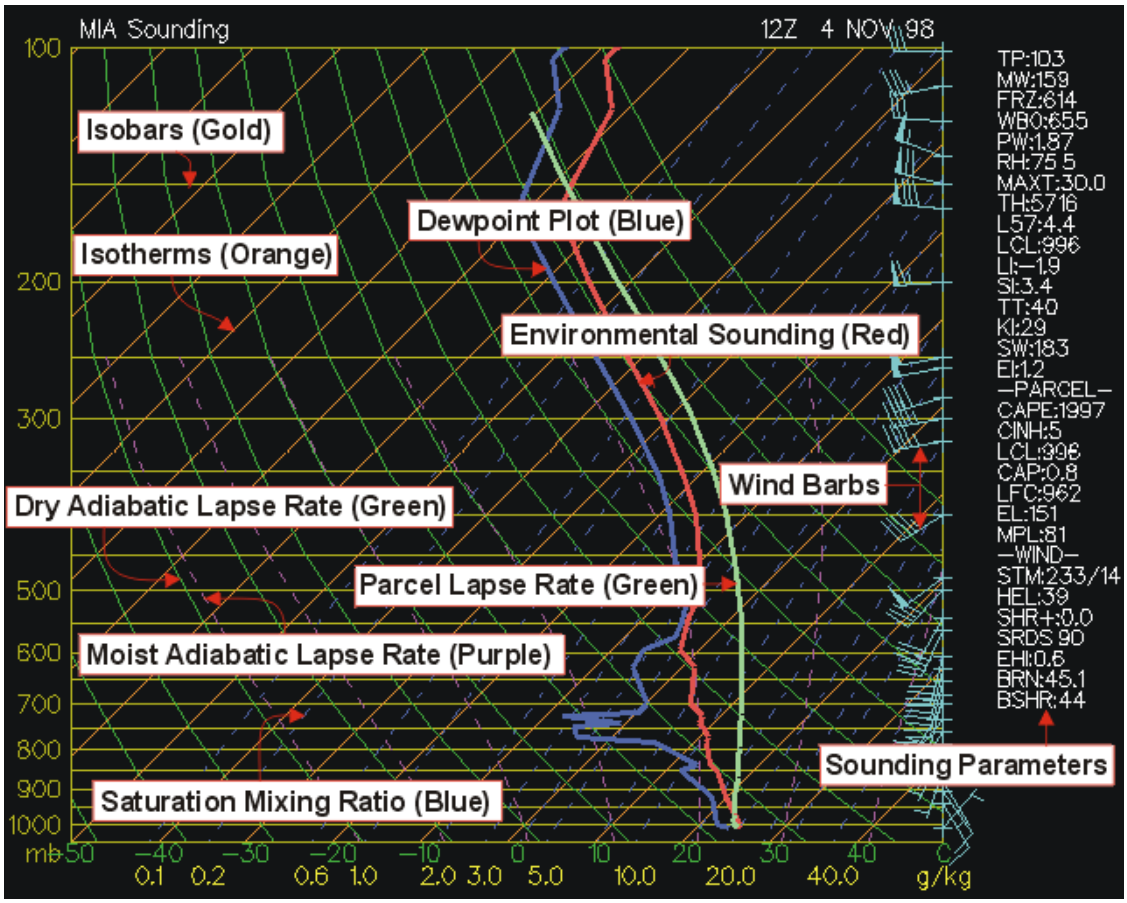
Lifting Condensation Level (LCL)

Theory:

The data used for plotting on the Skew-T, Log-P chart are obtained from a variety of sources, including radiosondes, dropsondes, aircraft soundings, rocketsondes, and upper-wind reports of pibals or rawinsondes. In normal operations, one chart is used for each reporting station, and not more than two soundings from new data are plotted on it. In addition, a trace from a previous sounding should be entered on the chart for continuity purposes. There should be a 12- hour time interval between each set of curves.

Below are all the basics lines that make up the Skew-T:



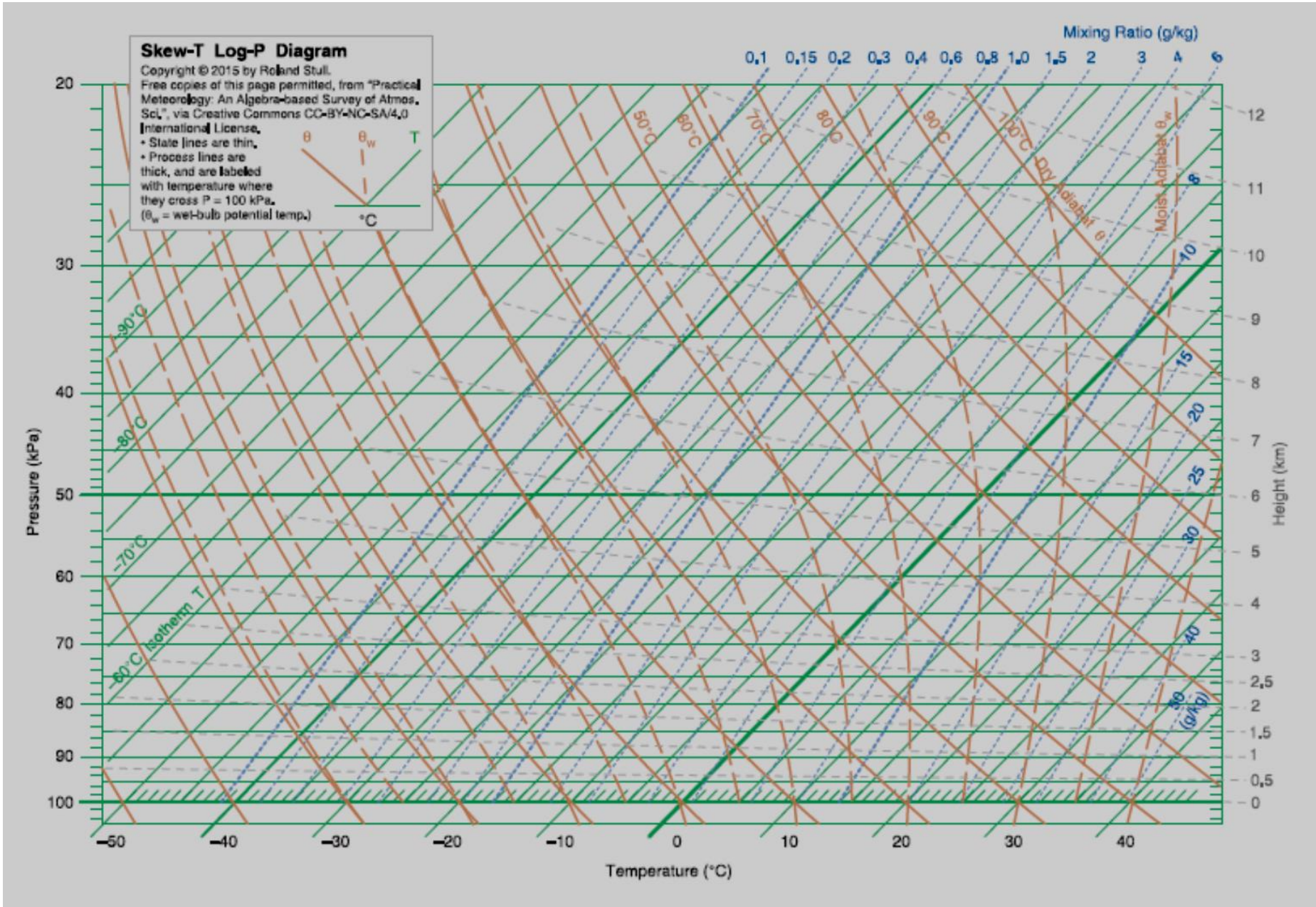
Lifting Condensation Level (LCL) is The height at which a parcel of air becomes saturated when it is lifted dry adiabatically is the Lifting Condensation Level. When a parcel of air is forced upward, as by being forced upward across land, a mountain, or over a layer of colder air, the air cools dry adiabatically. This is called mechanical lifting. If the air is lifted high enough, and cools enough, the parcel is saturated and any further cooling will result in condensation of moisture. This is the Lifting Condensation Level.

Procedure:

a. Draw T and T_d on the diagram, following isotherm and isobar lines
b. From the dew-point temperature of the level for which the LCL is desired to be determined, draw a line upward parallel to the saturation mixing ratio lines.
c. From the temperature value of the level for which the LCL is desired, draw a line upward parallel to the dry adiabat lines. The level where these two lines intersect is the LCL.

From the informations bellow draw the skew – t log p diagram, and find LCL Hiegt

P(kPa)	T(°C)	T_d(°C)
20	–25	–55
30	–25	–50
40	–20	–20
45	–15	–15
50	–10	–24
70	12	–20
80	19	3
90	21	15
99	29	17
100	33	20


Skew-T Log-P Diagram
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• State lines are thin.
• Process lines are thick, and are labeled with temperature where they cross P = 100 kPa.
(θw = wet-bulb potential temp.)
θ θw T
°C
Mixing Ratio (g/kg)
0.1 0.15 0.2 0.3 0.4 0.6 0.8 1.0 1.5 2 3 4 6
50°C 60°C 70°C 80°C 90°C 100°C
Dry Adiabat θ
Moist Adiabat θw
6 10 15 20 25 30 40 50 (g/kg)
-30°C -80°C -70°C -60°C Isotherm T
Pressure (kPa)
20 30 40 50 60 70 80 90 100
Height (km)
12 11 10 9 8 7 6 5 4 3 2.5 2 1.5 1 0.5 0
−50 −40 −30 −20 −10 0 10 20 30 40
Temperature (°C)